

U.S. Serial No. 10/731,777  
Amendment Dated August 29, 2005  
Response To Office Action Dated April 5, 2005

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### REMARKS

The pending application was filed on December 9, 2003 with claims 1-31. The Examiner issued a restriction requirement dated September 2, 2004 in which claims 1-24 were identified as being directed to a first specie and claim 25-31 were identified as being directed to a second specie. A response was filed by the undersigned representative on October 4, 2004 in which claims 1-24 were elected with traverse on the ground that the embodiment described in paragraph 2, page 3 and corresponding claim 1 is generic, and claims 25-31 are directed to a specie of that genus. The Examiner issued a Non-Final Office Action dated October 21, 2004 in which claims 1-31 were indicated as pending, claims 25-31 were withdrawn from consideration, and claims 1-24 were rejected. A response was filed February 17, 2005 amending the claims and canceling claims 7, 8, 18, 19, and 25-31. Claims 1-6, 9-17, 20-24, and 32-33 were pending in the application.

The Examiner issued a second Non-Final Office Action dated April 5, 2005 in which the Examiner rejected all pending claims. More specifically, the Examiner rejected claims 1, 6, 12, 15-17, 23 and 24 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 3,744,741 to *Christian et al.*, rejected claims 1-6, 12-17, 32 and 33 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 4,485,991 to *Fuller*, rejected claims 9, 10, 20 and 21 under 35 U.S.C. §103(a) as being unpatentable over *Fuller* in view of United States Patent No. 6,082,671 to *Michelson*, and rejected claims 11 and 22

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under 35 U.S.C. §103(a) as being unpatentable over *Fuller* or *Christian* in view of United States Patent No. 4,332,103 to *Shulman*.

Claims 1-6, 9-17, 20-24, and 32-33 are pending in the patent application. Claims 1, 3-5, 12, 14, 32 and 33 have been amended, and claims 2 and 13 have been canceled without prejudice. Claims 3-5 and 14 have been amended to change the dependency of the claims. In view of the arguments below, claims 1, 3-6, 9-12, 14-17, 20-24, and 32-33 are allowable, and the Examiner is respectfully requested to withdraw the rejections and issue a Notice of Allowance.

**I. SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT  
SUBMITTED JULY 8, 2005**

A Supplemental Information Disclosure Statement dated July 8, 2005 was submitted in connection with the above-identified patent application. The publications were not previously submitted because the inventors did not believe the publications were material. The inventors did not believe the publications were material to this application because each publication describes micro-air vehicles that do not have bendable wings. However, to avoid any possible discrepancies with 37 CFR §1.56, we have disclosed these publications for the Examiner's consideration.

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**II. REJECTION OF CLAIMS 1, 6, 12, 15-17, 23 and 24  
UNDER 35 U.S.C. §103(a)**

The Examiner rejected claims 1, 6, 12, 15-17, 23 and 24 under 35 U.S.C. §103(a) as being unpatentable over United States Patent No. 3,744,741 to *Christian et al.* The Examiner argued that, regarding claims 1 and 12, *Christian* discloses a wing for a micro-air vehicle having at least one layer of resilient material having a camber forming a concave surface facing downward, wherein the wing is bendable from a steady state position in a first direction such that tips of the wing may be bent toward the concave surface but not substantially in a second direction that is generally opposite to the first direction, and the wing is capable of returning to the steady state position by releasing the tips of the wing.

The Examiner admitted that *Christian* does not disclose a material selected for improving wind gust rejection due to adaptive washout as a result of the material flexibly decambering. The Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a material for improving wind gust rejection due to the adaptive washout, because it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. (citing *In re Leshin* 125 USPQ 416).

*Christian* does not disclose using a material selected for improving wind gust rejection due to adaptive washout as a result of the material flexibly decambering; however, the Examiner has concluded that use of such material would have been obvious to one of

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ordinary skill in the art at the time the invention was made. The Examiner cites *In re Leshin* for support of his conclusion. However, *In re Leshin* is directed to choosing a particular plastic for a use in which the use of plastic is already known. In stark contrast, the prior art does not disclose use of a material selected for improving wind gust rejection due to adaptive washout as a result of the material flexibly decambering in combination with a micro-air vehicle having a bendable wing. Independent claims 1 and 12 do not claim using a material that has already been used for the same purpose as its use in the past, as stated in *In re Leshin*.

The wing claimed in independent claims 1 and 12 are capable of "allow[ing] a micro air vehicle to fly more smoothly than conventional rigid wing designs in smooth and gusty wind conditions." See Specification, page 10, lines 4-5. The adaptive washout characteristic of the wing enables the wing to change the angle of attack when hit with a wind gust, thereby enabling the wing to fly more smoothly. In particular, the adaptive washout feature allows the angle of attack of the wing to be reduced when a wind gust is encountered, thereby enabling the wing to maintain the same level of flight. Without the adaptive washout feature, a wing of a micro air vehicle that encounters a wind gust, such as the monolithic, spring steel wing disclosed in *Christian*, experiences an increase in lift on the pressure side of the wing that causes the wing to rise quickly in the air resulting in very unstable flight.

The Examiner appears to be taking official notice that use of a flexible material selected for improving wind gust rejection due to adaptive washout as a result of the material

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flexibly decambering in combination with a micro-air vehicle having a bendable wing is commonly known within the art. However, such flexible material is not known in the art. The Applicant traverses the Examiner's conclusion, which is unsupported by any evidence. MPEP 2144.04 states "[i]f applicant adequately traverses the examiner's assertion of official notice, the examiner must provide documentary evidence in the next Office action if the rejection is to be maintained." (citing 37 CFR 1.104(c)(2). "[T]he Board [or Examiner] must point to some concrete evidence in the record in support of these findings" to satisfy the substantial evidence test." MPEP 2144.04, citing *In re Zurko*, 258 F.3d 1379, 1386 (C.A. Fed. 2001). Thus, the Examiner must provide support for the conclusion that use of a flexible material selected for improving wind gust rejection due to adaptive washout as a result of the material flexibly decambering, in combination with a micro-air vehicle having a bendable wing, is common knowledge within the art. Otherwise, the rejection must be withdrawn.

In addition, claims 1 and 12 have been amended to include, in relevant part, "a leading edge formed from a first material capable of bending in a first direction but not bending substantially in a second, generally opposite direction" and "at least one layer of a resilient, flexible material that is different from the material forming the leading edge, extending from the leading edge to the trailing edge." In contrast, *Christian* discloses a bendable wing formed from a single material, which does not enable the wing to reject wind gust due to the adaptive washout. Thus, the wing disclosed in *Christian* lacks the improved flight

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characteristics of the claimed wing. Therefore, for at least these reasons, independent claims 1 and 12 and those claims depending therefrom, are allowable, and the Examiner is respectfully requested to withdraw the rejection and issue a notice of allowance.

### III. REJECTION OF CLAIMS 1-6, 12-17, 32, AND 33 UNDER 35 U.S.C. §103(a)

The Examiner rejected claims 1-6, 12-17, 32, and 33 under 35 U.S.C. §103(a) as being anticipated by United States Patent No. 4,485,991 to *Fuller*. The Examiner argued that, regarding claims 1 and 12, *Fuller* discloses a wing for a micro-air vehicle in figure 2 having at least one layer of resilient material having a camber forming a concave surface facing downward, wherein the wing is bendable from a steady state position in a first direction such that tips of the wing may be bent towards the concave surface but not substantially in a second direction that is generally opposite to the first direction, and the wing is capable of returning to the steady state position by releasing the tips of the wing, as shown in Figure 6. The Examiner argued, regarding claims 2 and 13, that *Fuller* discloses at least one layer of a resilient material that comprises a leading edge formed from a first material that is different from the material forming a remainder of the at least one layer. The Examiner admitted that concerning claims 3-6, 14-17, 32 and 33 that *Fuller* does not disclose the selected material groups. However, the Examiner argued that it would have been obvious to one having ordinary skill in the art at the time the invention was made to select a material, since it has been held to be within the general skill of a worker in the art to select a known

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material on the basis of its suitability for the intended use as a matter of obvious design choice.

As previously discussed, independent claims 1 and 12 have been amended to include, in relevant part, "a leading edge formed from a first material capable of bending in a first direction but not bending substantially in a second, generally opposite direction" and "at least one layer of a resilient, flexible material that is different from the material forming the leading edge, extending from the leading edge to the trailing edge." (emphasis added). The wing claimed in independent claims 1 and 12 is capable of "allow[ing] a micro air vehicle to fly more smoothly than conventional rigid wing designs in smooth and gusty wind conditions." See Specification, page 10, lines 4-5. The adaptive washout characteristic of the wing enables the wing to absorb turbulence without resulting in rough air travel. In stark contrast, the wing disclosed in *Fuller* does not provide for adaptive washout of the wing in turbulent air conditions. In addition, *Fuller* does not disclose a leading edge formed from a different material than the remainder of the layer of resilient material. Rather, *Fuller* discloses an upper skin (11) and a lower skin (12) separated by an expanded plastic (14) positioned between the two layers, as shown in Figure 2 and discussed at column 2, lines 8 and 11-14. The upper skin and lower skin are not the leading edge and trailing edge of a blade. The wing of *Fuller* does not have the adaptive washout characteristic that enables the wing to absorb turbulence without resulting in rough air travel. Thus, for at least these reasons, independent claims 1 and 12, and those claims depending therefrom, are allowable,

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and the Examiner is respectfully requested to withdraw the rejection and issue a notice of allowance.

As regarding claims 2 and 13, the Examiner stated that column 1, lines 35-37 disclose using at least one layer of a resilient material comprising a leading edge formed from a first material that is different from the material forming a remainder of the layer. Claims 2 and 13 have been canceled without prejudice, and the elements have been incorporated within claims 1 and 12 respectively. Claims 1 and 12 have been distinguished above from the cited art.

As regarding claims 3-6, 14-17, 32 and 33, the Examiner admitted that *Fuller* does not disclose the selected material groups. The Examiner, however, stated that it would have been obvious to one of ordinary skill in the art at the time the invention was made to select a material, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. Citing *In re Leshin*, 125 USPQ 416.

*In re Leshin*, as noted above, is directed to choosing a particular plastic for a use in which the use of plastic is already known. *In re Leshin* does not stand for the use of a known material for different application, which is the case in claims 3-6, 14-17, 32 and 33. In the instant case, the prior art does not disclose use of the claimed materials for the claimed purpose. Thus, claims 3-6, 14-17, 32 and 33 are allowable. Furthermore, claims 3-6, 14-17, 32 and 33 depend directly or indirectly from independent claims 1 and 12, and are thus allowable. Claims 32 and 33 have been amended to change the dependency of the

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claims in view of claims 2 and 13 being canceled without prejudice. For at least these reasons, claims 3-6, 14-17, 32 and 33 are allowable, and the Examiner is respectfully requested to withdraw the rejection.

#### IV. REJECTION OF CLAIMS 9, 10, 20 AND 21 UNDER 35 U.S.C. § 103(a)

The Examiner rejected claims 9, 10, 20 and 21 under 35 U.S.C. § 103(a) as being unpatentable over *Fuller* in view of United States Patent No. 6,082,671 to *Michelson*. The Examiner stated that *Fuller* discloses every aspect of the invention except for the size of the aircraft. The Examiner stated that *Michelson* discloses that it is known in the art to design micro air vehicles no greater than 15 cm in any dimension. The Examiner concluded that it would have been obvious to one having ordinary skill in the art to employ this idea into the device of *Fuller* for the purpose of reducing the visibility of the aircraft from the ground.

As regarding claims 9 and 20, the relevant portion of the claims state "wherein a wing span of the wing is between about three inches and about twenty four inches." In stark contrast, *Michelson* discloses that, according to the Examiner, "it is known in the art to design micro air vehicles no greater than 15 cm in any dimension." Thus, *Michelson teaches away from* the claimed range of a wing span between about three inches and about twenty four inches. In addition, neither reference makes any reference to a micro air vehicle having the capability to fit within a tube having the claimed size. Furthermore, claims 9 and 10 depend from claim 1, which is allowable for the previously set forth reasons, and claims 20

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and 21 depend from claim 12, which is also allowable for the previously set forth reasons.

Therefore, for at least these reasons, claims 9, 10, 20 and 21 are allowable, and the Examiner is respectfully requested to withdraw the rejection.

#### V. REJECTION OF CLAIMS 11 AND 22 UNDER 35 U.S.C. § 103(a)

The Examiner rejected claims 11 and 22 as being unpatentable over *Fuller* or *Christian et al.* in view of United States Patent No. 4,332,103 to *Shulman*. The Examiner admitted that neither *Fuller* nor *Christian et al.* discloses a riser section forming a concave portion on an upper surface of the wing proximate to a trailing edge of the wing. The Examiner stated, however, that *Shulman* discloses a riser section and that it is a well known design to impart a slight climbing flight characteristic to the glider, as discussed at column 2, line 65. The Examiner concluded that it would have been obvious to one of ordinary skill in the art at the time the invention was made to use the riser design in the wing of both *Fuller* and *Christian et al.* for the purpose of increasing the aircraft dependency.

Claims 11 and 22 depend from allowable claims 1 and 12, respectively. Thus, claims 11 and 22 are allowable as written, and the Examiner is respectfully requested to withdraw the rejection.

#### VI. PETITION FOR TWO MONTH EXTENSION OF TIME

This is a Petition for a Two Month Extension of Time pursuant to 37 CFR § 1.136. Please charge the fee in the amount of \$225.00 for a two (2) month extension of time

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pursuant to 37 CFR § 1.17(a)(2) and charge any underpayment or credit any overpayment to

Deposit Account No. 50-0951. A duplicate copy of this communication is enclosed.

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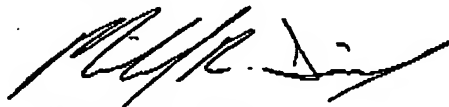
### CONCLUSION

For at least the reasons given above, claims 1, 3-6, 9-12, 14-17, 20-24, and 32-33 define patentable subject matter and are thus allowable. The undersigned representative thanks the Examiner for examining this application.

Should the Examiner believe that anything further is necessary in order to place the application in better condition for allowance, the Examiner is respectfully requested to contact the undersigned representative at the telephone number listed below.

No fees in addition to the two-month extension of time fee are believed due; however, the Commissioner is hereby authorized to charge any deficiency, or credit any overpayment, to Deposit Account No. 50-0951.

Respectfully submitted,



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